US Army Corps of Engineers Sacramento District
Hawthorne Army Depot
Hawthorne, Nevada

Decision Document
Solid Waste Management Unit C01a/01b
Building 102-31 Rotary Deactivation Furnaces

August 2001

Contract No. GS-10F-0268K
Delivery Order T0900BH0418

TETRA TECH
180 Howard Street, Suite 250
San Francisco, CA 94105

Decision Document
SWMU C01a/01b

August 2001

The selected remedy is protective of human health and the environment. It has been shown that exposure to the chemicals of concern at this SWMU has been mitigated to the level that is nonhazardous to human health and the environment, and there is no potential for an exposure to these chemicals in the future.

US Army

26 NOV 2001

Anne L. Davis
Lieutenant Colonel, US Army
Commanding

State of Nevada

30 Nov 2001

Paul Liebendorfer
Chief, Bureau of Federal Facilities

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1.0 INTRODUCTION

This decision document describes the rationale for the proposed closure of solid waste management unit (SWMU) C01a/01b at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada (Figure 1-1). This SWMU is the former site of two deactivation furnaces used for demilitarizing small arms ammunition, primers, and fuses. Tetra Tech, Inc. (Tt) prepared this decision document for the US Army Corps of Engineers, Sacramento District (USACE), with guidance from HWAD for submittal and approval by the Nevada Department of Environmental Protection (NDEP).

Tt has performed remedial investigations and groundwater monitoring at HWAD since 1993, primarily at SWMUs designated by the Army and the NDEP. The purpose of the sampling was to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, to present conclusions, and to recommend remediation, if necessary.

With guidance from the NDEP, Tt established basewide proposed closure goals (PCGs) as acceptable levels for soil so that HWAD could recommend SWMU closure, and to help direct the investigative efforts toward those SWMUs where the target analytes were of greatest concern. Also, HWAD-specific groundwater action levels were established as acceptable concentrations to determine if further action would be required to remediate analytes of concern in the groundwater. Following Tt's evaluation of the investigation results and after completing a site-specific risk assessment, remediation goals for this SWMU were recommended which the NDEP approved. The PCGs and remediation goals are included in Appendix A.

2.0 SITE HISTORY

SWMU C01a/01b is in HWAD's central magazine area, east of Thorne Road and within the 102 Magazine Group (Figure 1-1). This SWMU was the site of two rotary deactivation furnaces on the northern and southern ends of Building 102-31 (Figure 1-2). Both furnaces were installed on concrete pads measuring approximately 35 feet wide by 55 feet long.

The USACE, HWAD, and the NDEP agreed to define the boundaries of each SWMU using annotated monuments and survey pins. As part of our field investigation, we surveyed SWMU C01a/01b and constructed two survey monuments. A brass survey pin on each monument designates them as HWAAP-51-1996 and HWAAP-63-1996 and includes the SWMU number C01a/01b. four corner pins were set and surveyed to define the SWMU boundary, with

monument HWAAP-51-1996 near the south corner and monument HWAAP-63-1996 near the north corner. The location of these corner markers and the SWMU boundary are shown on Figure 1-2. Survey data is presented in Appendix B.

The current depth to groundwater in the vicinity of SWMU C01a/01b at approximately 100 feet below ground surface (bgs) based on the data reported in the 2000 annual groundwater report (Tt 2001).

3.0 SITE CONDITIONS

The United States Army Environmental Hygiene Agency (USAEHA) (1988), RAI (1992), and Jacobs Engineering (1988) have inspected SWMU C01a/01b. During its inspection, USAEHA noted that the furnaces appeared clean and that there was a small amount of soot and ash near the baghouse hoppers and feed chains at both incinerators.

Tt inspected SWMU C01a/01b in November 1993. The incinerators were inside unroofed enclosures constructed from ten-foot-high metal ammunition boxes. The incinerators were mounted so that material could be fed from inside Building 102-31. The exhaust stacks and baghouses were outside the enclosures, with entrances along the southern walls. Most of the furnace and associated equipment, including the baghouses, were dismantled and removed. There were scattered expended small arms rounds, shell casings, and fragments of slag on the ground, mostly on the north, south, and east sides of the building.

4.0 INVESTIGATIONS

From 1994 through 1997, Tt collected 231 surface soil samples and 19 duplicate surface soil samples at SWMU C01a/01b and had them analyzed for lead. Two hundred and eighteen of these 231 soil samples contained lead concentrations exceeding the HWAD PCG of 100 mg/kg, with a maximum concentration of 200,000 mg/kg (the 100 mg/kg for lead was in place at the time the initial remedial investigation occurred, since that time the standard has been revised to 1,000 mg/kg). Two hundred and twenty-nine of these 231 soil samples contained lead concentrations greater than the calculated HWAD lead background concentration of 16.7 mg/kg. A table of these results is included in Appendix C.

Three cone penetrometer test (CPT) soundings at SWMU C01a/01b found clayey silt to sand to a depth of 20 feet. Tt drilled six CPT borings and collected three soil samples from each boring. The borings were located where the surface soil samples showed the highest concentrations of lead so that they would evaluate the potential for lead impact in the subsurface worst-case scenarios. Lead was detected in all of these CPT subsurface soil samples, ranging from 6.9 mg/kg to 1,500 mg/kg. No other metals were analyzed for in the subsurface soil samples. A table of the results is included in Appendix C.

The one subsurface soil sample with the greatest lead concentration was collected at 2.5 feet bgs and contained 1,500 mg/kg; however, the collocated duplicate sample contained only 400 mg/kg of lead. Based on the other borings, the elevated lead concentration at a depth of 2.5 feet in soil boring SB06 appears to be an anomaly. The second greatest concentration of lead in a subsurface

soil sample was 250 mg/kg collected at 13 feet bgs. This concentration does not appear to be from leaching the surface soils. The two samples collected at six and nine feet bgs in the same boring contain only 30 and 6.9 mg/kg of lead, respectively. It is likely that the high lead concentration detected in the deeper sample at this boring is from a high concentration of lead soil sloughing into the boring from the surface during sampling.

In 1997, Tt collected and analyzed fourteen surface soil samples and two duplicate surface soil samples for metals other than lead. These samples were collected in areas where lead concentrations were high to assess if metals other than lead were released from the furnaces. These samples contained the highest concentrations of zinc (2,260 mg/kg to 412,000 mg/kg) and copper (1,970 mg/kg to 256,000 mg/kg), which are the metals that make up brass and that likely were released from munitions casings. Moderate concentrations were reported for aluminum (4,830 mg/kg to 41,600 mg/kg), barium (696 mg/kg to 43,200 mg/kg), iron (1,790 mg/kg to 11,000 mg/kg), magnesium (4,580 mg/kg to 32,900 mg/kg), and sodium (251 mg/kg to 48,300 mg/kg). Low concentrations were reported for antimony (62.3 mg/kg), arsenic (3 mg/kg to 16.5 mg/kg), cadmium (1.2 mg/kg to 95.7 mg/kg), total chromium (5 mg/kg to 129 mg/kg), cobalt (4.3 mg/kg), manganese (53.4 mg/kg to 262 mg/kg), mercury (0.21 mg/kg to 1.3 mg/kg), molybdenum (2.7 mg/kg), nickel (4 mg/kg to 37.6 mg/kg), potassium (1.320 mg/kg to 1,550 mg/kg), silver (0.52 mg/kg to 10.6 mg/kg), and vanadium (14.2 mg/kg). A table of these results is included in Appendix C.

Based on all of the remedial investigation data, lead was the only contaminant of concern at SWMU C01a/01b. The concentrations of lead were greater than the PCG, indicating that this site needed remediation before HWAD could recommend closure. The vertical extent of the lead-contaminated soil did not appear to exceed one foot bgs. The lateral extent of the high lead concentrations (greater than 1,000 mg/kg) in the surface soil extended approximately 300 feet to the northwest, 450 feet to the southeast, 375 feet to the southwest, and 300 feet to the northwest from Building 102-31.

Tt found the groundwater beneath SWMU C01a/01b not to be contaminated with lead (Tt 2001). Monitoring wells IRPMW28 and IRPMW29 are the nearest downgradient monitoring wells, and IRPMW30 and IRPMW31 are the nearest upgradient monitoring wells. Both pairs of wells are approximately 1,000 feet from the site. A table of the groundwater data for lead from these wells is included in Appendix A.

The detected lead concentrations in the groundwater samples from these wells during the base-wide groundwater monitoring from 1997 through 1999 ranged from 1.1 µg/l to 4.4 µg/l. All of these concentrations are less than the HWAD groundwater action level for lead of 15 µg/l. There also is little variance in the lead concentrations in the groundwater samples collected from the upgradient and downgradient wells. Also, elevated concentrations of lead in the soil at the site are found only to a depth of two feet bgs, with the shallowest groundwater at a depth of approximately 100 feet bgs. Based on these data, the groundwater beneath SWMU C01a/01b has not been affected by the elevated lead concentrations in the near-surface soils.

5.0 REMEDIATION

To assess a cost-effective remedial technique to mitigate the lead in the surface soils at SWMU C01a/01b, Tt completed a health-based risk assessment of the primary exposure pathways by ingestion and inhalation. They also evaluated innovative technologies, and selected one of these technologies for full-scale implementation.

Based on these studies, the approved technology for remediating SWMU C01a/01b was to treat those soils with the greatest concentrations of lead with a phosphate stabilization process so that the lead would not be leachable. Based on the ingestion scenario of the risk assessment, the stabilized soil could pose a human health threat; therefore, all of the treated soils were excavated and disposed of off-site but on-base. The excavated areas were backfilled with "clean" soil, and the site was reclaimed by hydroseeding the disturbed area with native species.

NDEP established a cleanup goal of 2,000 mg/kg as the maximum concentrations of lead that could remain in the surface soils at the site without being remediated. Based on the TCLP testing method for all of the treated soil, a lead treatment goal (LTG) of 5 mg/l of lead was established. Also established was a lead excavation goal (LEG) of 2,000 mg/kg of total lead as the maximum concentrations of lead in soils that could be left in the bottom of the excavations, and established a lead backfill goal of one-quarter of the LEG at 500 mg/kg as the maximum concentration of total lead in the soils imported to the site for backfill. Lastly, Tt established a soil boring goal equal to the LEG of 2,000 mg/kg to evaluate additional subsurface soil samples collected from soil borings after the treatment. A table of these remediation goals is included in Appendix A.

Tt treated in situ the lead contaminated soil at SWMU C01a/01b, which contained greater than 2,000 mg/kg of total lead within the top one foot of surface soils, with a phosphate chemical mixture. They excavated and disposed of the treated soil in a borrow pit at HWAD, and capped it. The site was backfilled and hydroseeded the excavations. Additional subsurface soil samples from borings were collected. Figure 1-1 shows the location of the onsite borrow pit where the treated soil was deposited.

The soil beneath the buildings and railroad tracks were assessed not to be contaminated because these structures were in place before the lead emissions were released. However, there was a potential for lead dust to be deposited on the ballast along the railroad tracks. The cost of removing these sections of track with the affected ballast was cost prohibitive and would have disrupted the HWAD mission. The NDEP agreed that the ballast could be treated in situ provided it was treated with twice the treatment dose as the phosphate mixture used to successfully treat the surface soils. This in situ treatment was successfully completed.

6.0 REMEDIATION RESULTS

The boundaries of the soil treatment area included all of the soils with concentrations greater than 2,000 mg/kg. The surface soils above a depth of one foot bgs were successful treated to less than the LTG. A table of the 55 soil samples collected to assess this treatment is included in

Appendix C. The TCLP results for these samples ranged from 0.0045 mg/l to 3.0 mg/l compared to the LTG of 5 mg/l.

Tt excavated and disposed of all of the soil with elevated concentrations of lead within the treatment boundary at SWMU C01a/01b. A table of the 63 soil samples collected from the excavations is included in Appendix C. The total lead concentrations for these samples ranged from 1.7 mg/kg to 1,280 mg/kg compared to the LEG of 2,000 mg/kg.

All of the soil used to backfill the excavations contained lead concentrations less than backfill goal. A table of the 15 soil samples collected from the backfill material is included in Appendix C. The total lead concentrations for these samples ranged from 2.4 mg/kg to 9 mg/kg, compared to the backfill goal of 500 mg/kg.

All of the subsurface soil samples contained lead concentrations less than the soil boring goal. A table of these 36 subsurface soil samples is included in Appendix C. The total lead concentrations for these samples ranged from 1.5 mg/kg to 113 mg/kg, compared to the soil boring goal of 2,000 mg/kg.

7.0 PUBLIC INVOLVEMENT

It is US Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository at the local public library, which includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD, the repository will be updated.

HWAD has solicited community participation to establish a restoration advisory board (RAB). To date there has been insufficient response, and HWAD has not formed a RAB. HWAD has held open houses to inform the public of ongoing environmental issues and will continue to solicit community involvement. HWAD will establish a RAB should there be sufficient community interest.

8.0 CONCLUSION

All of the remedial actions have been completed in accordance with the lead treatability study work plan to remediate SWMU C01a/01b. All of the samples collected during the various treatment actions were less than their respective remediation goals. The elevated lead concentrations at this site have been mitigated to levels that do not pose a threat to human health for on-site or off-site receptors. No additional investigations or remediation are necessary for this SWMU before closure is recommended; therefore, we recommend SWMU C01a/01b for closure, with the restrictions that the site remain only for industrial use, and that the site be documented on the HWAD master plan.

9.0 REFERENCES

Everett, D. E., and F. E. Rush. 1967. A Brief Appraisal of the Water Resources of the Walker Lake Area, Mineral, Lyon, and Churchill Counties, NV. Nevada Department of Water Resources. Reconnaissance Series Report No. 40.

RAI. 1992. Site Screening Inspection for the Hawthorne Army Ammunition Plant, Hawthorne, Nevada. Prepared for the US Army Corps of Engineers Toxic and Hazardous Materials Agency by Resource Applications, Inc., Falls Church, Virginia. December 1992.

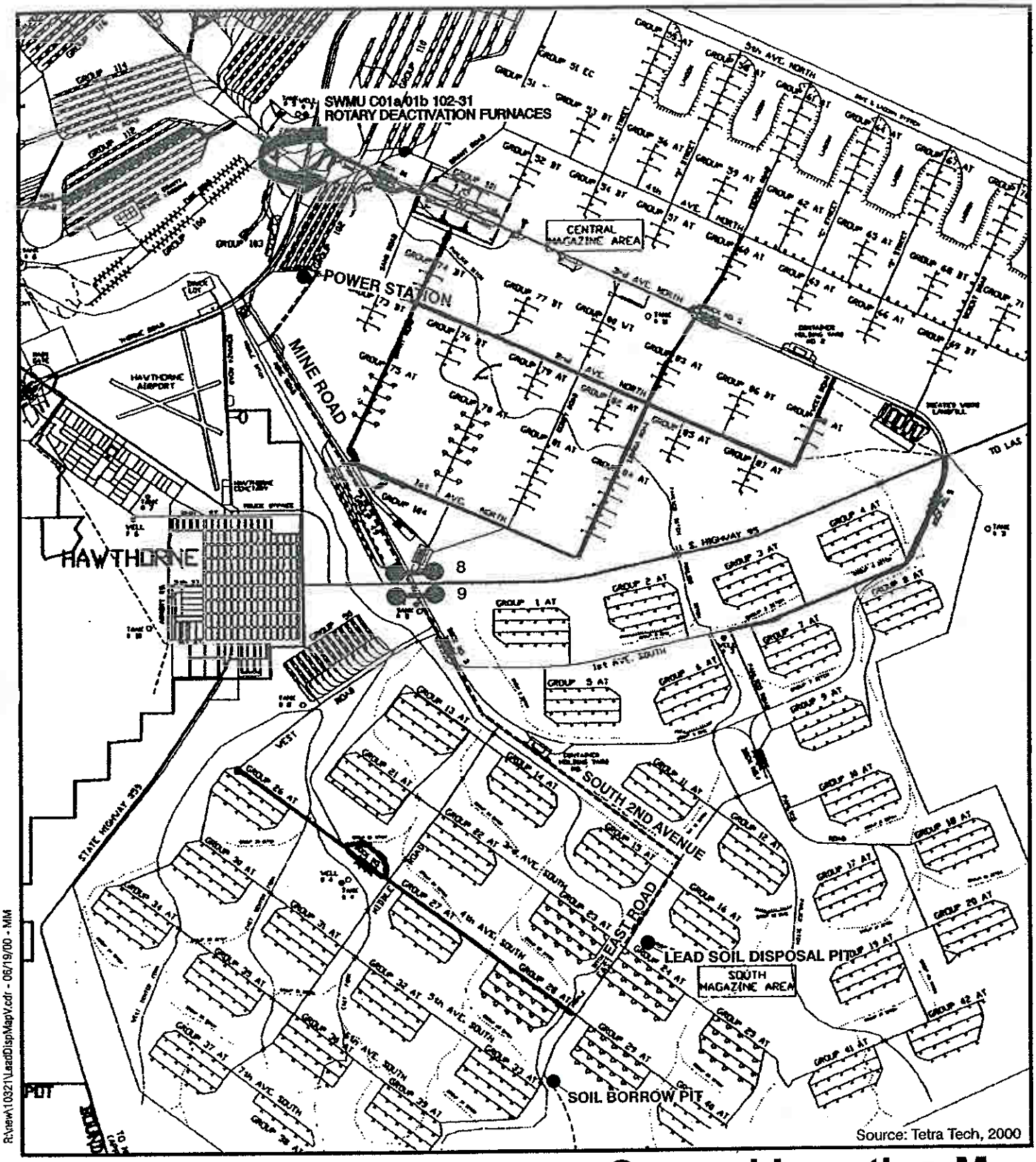
Tetra Tech, Inc. 1993. Draft Technical Memorandum for Group B SWMUs, Hawthorne Army Ammunition Plant. November 22, 1993.

_____. 2001. 2000 Annual Groundwater Monitoring Report, Hawthorne Army Depot, Hawthorne, Nevada. May 2001.

USAEHA. 1988. Final Report. Groundwater Contamination Survey No. 38-26-0850-88. Evaluation of Solid Waste Management Units. HWAAP, Hawthorne, Nevada. May 12 to 19, 1987, and August 1 to 5, 1988.

Tetra Tech, Inc. 2001. Draft Report In-situ Lead Remediation Treatability Study at SWMU C01a/01b Building 102-31 Rotary Deactivation Furnaces. July 2001

FIGURES



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LEGEND

Security Gate

Preferred

General Location Map
SWMU C01a/01b

Hawthorne Army Depot
Hawthorne, Nevada

Figure 1-1

Legend:

- Boundary Corner Pin
- Fence
- Railroad
- SWMU Monument

N

0 100 200

Approximate Scale in Feet

Tetra Tech, Inc.

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Site Map
SWMU C01a/01b
Building 102-31 Rotary Deactivation Furnaces

Hawthorne Army Depot
Hawthorne, Nevada

Figure 1-2

Appendix A

APPENDIX A

PROPOSED CLOSURE GOALS, HWAD GROUNDWATER ACTION LEVELS, AND APPROVED REMEDIATION GOALS

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S[a]
2-Amino-dinitrotoluene	Explosive	NC	-	NA[b]
4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	160	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
Tetryl	Explosive	NC	800	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	4	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	233	Calculated Subpart S
Aluminum	Metal	NC	80,000	Calculated Subpart S
Arsenic (cancer endpoint)	Metal	C & NC	30	Background[c]
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG[d]
Mercury and compounds (inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit[e]
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NDEP Level Clean-up[f]
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA[g]
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S
Butyl benzyl phthalate	SVOC	NC	16,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC		-	NA
Phenol	SVOC	NC	48,000	Calculated Subpart S

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl)ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	16,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC		-	NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCDD	Dioxin	C	0.000005	Calculated Subpart S

[a] RCRA 55 FR 30870

[b] Not available

[c] Highest background concentration detected in 50 background soil samples

[d] Smucker, Stanford J. USEPA Rgion IX, Preliminary Remedial Goals, Second Half, Sep. 1995

[e] Method detection limit for Volatile Organic Compounds by EPA Method 8260 or
Semi-Volatile Organic Compounds analyzed by EPA Method 8270

[f] Nevada Division of Environmental Protection

[g] Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

HWAD - Groundwater Action Level

Casno	Analyte	Action level	Units
630-20-6	1,1,1,2-Tetrachloroethane	0.43	ug/L
71-55-6	1,1,1-Trichloroethane	200	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.055	ug/L
79-00-5	1,1,2-Trichloroethane	5	ug/L
75-34-3	1,1-Dichloroethane	810	ug/L
75-35-4	1,1-Dichloroethene	7	ug/L
96-18-4	1,2,3-Trichloropropane	0.0016	ug/L
95-94-3	1,2,4,5-Tetrachlorobenzene	11	ug/L
120-82-1	1,2,4-Trichlorobenzene	70	ug/L
95-63-6	1,2,4-Trimethylbenzene	12	ug/L
96-12-8	1,2-Dibromo-3-chloropropane	0.2	ug/L
106-93-4	1,2-Dibromoethane (EDB)	0.05	ug/L
95-50-1	1,2-Dichlorobenzene	600	ug/L
107-06-2	1,2-Dichloroethane	5	ug/L
78-87-5	1,2-Dichloropropane	5	ug/L
528-29-0	1,2-Dinitrobenzene	15	ug/L
122-66-7	1,2-Diphenylhydrazine	0.084	ug/L
99-35-4	1,3,5-Trinitrobenzene	1100	ug/L
541-73-1	1,3-Dichlorobenzene	17	ug/L
99-65-0	1,3-Dinitrobenzene	3.7	ug/L
106-46-7	1,4-Dichlorobenzene	75	ug/L
98-82-8	1-Methylethylbenzene	19	ug/L
58-90-2	2,3,4,6-Tetrachlorophenol	1100	ug/L
1746-01-6	2,3,7,8-TCDD	0.00003	ug/L
93-76-5	2,4,5-T	370	ug/L
93-72-1	2,4,5-TP (Silvex)	50	ug/L
95-95-4	2,4,5-Trichlorophenol	3700	ug/L
88-06-2	2,4,6-Trichlorophenol	6.1	ug/L
118-96-7	2,4,6-Trinitrotoluene	2.2	ug/L
94-75-7	2,4-D	70	ug/L
94-82-6	2,4-DB	290	ug/L
120-83-2	2,4-Dichlorophenol	110	ug/L
105-67-9	2,4-Dimethylphenol	730	ug/L
51-28-5	2,4-Dinitrophenol	73	ug/L
121-14-2	2,4-Dinitrotoluene	73	ug/L
606-20-2	2,6-Dinitrotoluene	37	ug/L
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.099	ug/L
91-58-7	2-Chloronaphthalene	490	ug/L
95-57-8	2-Chlorophenol	38	ug/L
95-49-8	2-Chlorotoluene	120	ug/L
95-48-7	2-Methylphenol	1800	ug/L
88-74-4	2-Nitroaniline	2.2	ug/L
91-94-1	3,3-Dichlorobenzidine	0.15	ug/L
TT007	3/4-Methylphenol(m/p-Cresol)	180	ug/L
99-08-1	3-Nitrotoluene	370	ug/L
72-54-8	4,4-DDD	0.28	ug/L
72-55-9	4,4-DDE	0.2	ug/L
50-29-3	4,4-DDT	0.2	ug/L
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.099	ug/L
106-47-8	4-Chloroaniline	150	ug/L
106-44-5	4-Methylphenol	180	ug/L

HWAD - Groundwater Action Level

Casno	Analyte	Action level	Units
99-99-0	4-Nitrotoluene	370	ug/L
83-32-9	Acenaphthene	370	ug/L
67-64-1	Acetone	610	ug/L
98-86-2	Acetophenone	0.042	ug/L
309-00-2	Aldrin	0.004	ug/L
319-84-6	alpha-BHC	0.011	ug/L
7429-90-5	Aluminum	37000	ug/L
62-53-3	Aniline	12	ug/L
120-12-7	Anthracene	1800	ug/L
12674-11-2	Aroclor-1016	0.5	ug/L
11104-28-2	Aroclor-1221	0.5	ug/L
11141-16-5	Aroclor-1232	0.5	ug/L
53469-21-9	Aroclor-1242	0.5	ug/L
12672-29-6	Aroclor-1248	0.5	ug/L
11097-69-1	Aroclor-1254	0.5	ug/L
11096-82-5	Aroclor-1260	0.5	ug/L
7440-38-2	Arsenic	50	ug/L
7440-38-2d	Arsenic, Dissolved	50	ug/L
7440-39-3	Barium	2000	ug/L
7440-39-3d	Barium, Dissolved	2000	ug/L
71-43-2	Benzene	5	ug/L
92-87-5	Benzidine	0.00029	ug/L
56-55-3	Benzo(a)anthracene	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.2	ug/L
205-99-2	Benzo(b)fluoranthene	0.2	ug/L
65-85-0	Benzoic acid	150000	ug/L
100-51-6	Benzyl alcohol	11000	ug/L
7440-41-7	Beryllium	4	ug/L
7440-41-7d	Beryllium, Dissolved	4	ug/L
319-85-7	beta-BHC	0.037	ug/L
111-44-4	bis(2-Chloroethyl) ether	0.0098	ug/L
108-60-1	bis(2-Chloroisopropyl)-ether	0.27	ug/L
117-81-7	bis(2-Ethylhexyl)-phthalate	6	ug/L
75-27-4	Bromodichloromethane	100	ug/L
75-25-2	Bromoform	100	ug/L
74-83-9	Bromomethane	8.7	ug/L
85-68-7	Butyl benzyl phthalate	100	ug/L
7440-43-9	Cadmium	5	ug/L
7440-43-9d	Cadmium, Dissolved	5	ug/L
75-15-0	Carbon disulfide	1000	ug/L
56-23-5	Carbon tetrachloride	5	ug/L
57-74-9	Chlordane	2	ug/L
108-90-7	Chlorobenzene	100	ug/L
67-66-3	Chloroform	100	ug/L
74-87-3	Chloromethane	1.5	ug/L
7440-47-3	Chromium (total)	100	ug/L
7440-47-3d	Chromium, Dissolved	100	ug/L
1333-82-0	Chromium, Hexavalent	180	ug/L
218-01-9	Chrysene	0.2	ug/L
156-59-2	cis-1,2-Dichloroethene	70	ug/L

HWAD - Groundwater Action Level

Casno	Analyte	Action level	Units
5103-74-2	cis-Chlordane	2	ug/L
57-12-5	Cyanide, Total	200	ug/L
75-99-0	Dalapon	200	ug/L
8065-48-3	Demeton	1.5	ug/L
333-41-5	Diazinon	33	ug/L
53-70-3	Dibenz(a,h)anthracene	0.0092	ug/L
132-64-9	Dibenzofuran	24	ug/L
124-48-1	Dibromochloromethane	100	ug/L
1918-00-9	Dicamba	1100	ug/L
75-71-8	Dichlorodifluoromethane	390	ug/L
62-73-7	Dichlorvos	0.23	ug/L
60-57-1	Dieldrin	0.0042	ug/L
84-66-2	Diethyl phthalate	29000	ug/L
131-11-3	Dimethyl phthalate	370000	ug/L
84-74-2	Di-n-butyl phthalate	3700	ug/L
117-84-0	Di-n-octyl phthalate	730	ug/L
88-85-7	Dinoseb	7	ug/L
122-39-4	Diphenylamine	910	ug/L
298-04-4	Disyston (Disulfoton)	1.5	ug/L
2921-88-2	Dursban (Chlorpyrifos)	110	ug/L
959-98-8	Endosulfan I	220	ug/L
72-20-8	Endrin	2	ug/L
100-41-4	Ethylbenzene	700	ug/L
206-44-0	Fluoranthene	1500	ug/L
86-73-7	Fluorene	240	ug/L
16984-48-8	Fluoride	4000	ug/L
58-89-9	gamma-BHC (Lindane)	0.2	ug/L
76-44-8	Heptachlor	0.4	ug/L
1024-57-3	Heptachlor epoxide	0.2	ug/L
118-74-1	Hexachlorobenzene	1	ug/L
87-68-3	Hexachlorobutadiene	0.86	ug/L
77-47-4	Hexachlorocyclopentadiene	50	ug/L
67-72-1	Hexachloroethane	4.8	ug/L
2691-41-0	HMX	1800	ug/L
193-39-5	Indeno(1,2,3-c,d)pyrene	0.092	ug/L
7439-89-6	Iron	11000	ug/L
78-59-1	Isophorone	71	ug/L
7439-92-1	Lead	15	ug/L
7439-92-1d	Lead, Dissolved	15	ug/L
TT015	m- & p-Xylene(s)	10000	ug/L
94-74-6	MCPA	18	ug/L
93-65-2	MCPP	37	ug/L
7439-97-6	Mercury	2	ug/L
7439-97-6d	Mercury, Dissolved	2	ug/L
150-50-5	Merphos	1.1	ug/L
72-43-5	Methoxychlor	40	ug/L
298-00-0	Methyl parathion	9.1	ug/L
75-09-2	Methylene Chloride	5	ug/L
1634-04-4	MTBE	20	ug/L
300-76-5	Naled	73	ug/L

HWAD - Groundwater Action Level

Casno	Analyte	Action level	Units
91-20-3	Naphthalene	6.2	ug/L
14797-55-8	Nitrate	10000	ug/L
TT011	Nitrate plus Nitrite as N	1000	ug/L
14797-65-0	Nitrite	1000	ug/L
98-95-3	Nitrobenzene	3.4	ug/L
62-75-9	N-Nitrosodimethylamine	0.0013	ug/L
924-16-3	N-Nitroso-di-n-butylamine	0.002	ug/L
621-64-7	N-Nitroso-di-n-propylamine	0.0096	ug/L
86-30-6	N-Nitrosodiphenylamine	14	ug/L
95-47-6	o-Xylene	10000	ug/L
608-93-5	Pentachlorobenzene	29	ug/L
82-86-8	Pentachloronitrobenzene	0.26	ug/L
87-86-5	Pentachlorophenol	1	ug/L
108-95-2	Phenol	22000	ug/L
298-02-2	Phorate (Thimet)	7.3	ug/L
88-89-1	Picric Acid	1	ug/L
23950-58-5	Pronamide	2700	ug/L
129-00-0	Pyrene	180	ug/L
121-82-4	RDX	0.61	ug/L
299-84-3	Ronnel	1800	ug/L
7782-49-2	Selenium	180	ug/L
7782-49-2d	Selenium, Dissolved	180	ug/L
7440-22-4	Silver	180	ug/L
7440-22-4d	Silver, Dissolved	180	ug/L
100-42-5	Styrene	100	ug/L
127-18-4	Tetrachloroethene	5	ug/L
961-11-5	Tetrachlorvinphos	2.8	ug/L
479-54-8	Tetryl	365	ug/L
108-88-3	Toluene	1000	ug/L
8001-35-2	Toxaphene	3	ug/L
156-60-5	trans-1,2-Dichloroethene	100	ug/L
10061-02-6	trans-1,3-Dichloropropene	0.081	ug/L
5103-71-9	trans-Chlordane	2	ug/L
79-01-6	Trichloroethene	5	ug/L
75-69-4	Trichlorofluoromethane	1300	ug/L
108-05-4	Vinyl acetate	410	ug/L
75-01-4	Vinyl chloride	2	ug/L

Site-specific Soil Treatment Goals
SWMU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Treatment Activity	Goals
Soil Stabilization	LTG—Leachable lead concentrations less than 5.0 mg/l by TCLP
Excavation	LEG—Total lead concentration in soil left in place at less than 2,000 mg/kg
Backfilling	Total lead concentrations of imported soil less than one-fourth of the LEG at 500 mg/kg
Soil Borings	Total lead concentrations in the subsurface soils less than the LEG of 2,000 mg/kg

TCLP = Toxicity Characteristic Leaching Procedure, as defined by Test Methods for Evaluating Solid Wastes, SW846, Method 1311 and EPA analytical method 6010.

Appendix B

APPENDIX B

SURVEY DATA

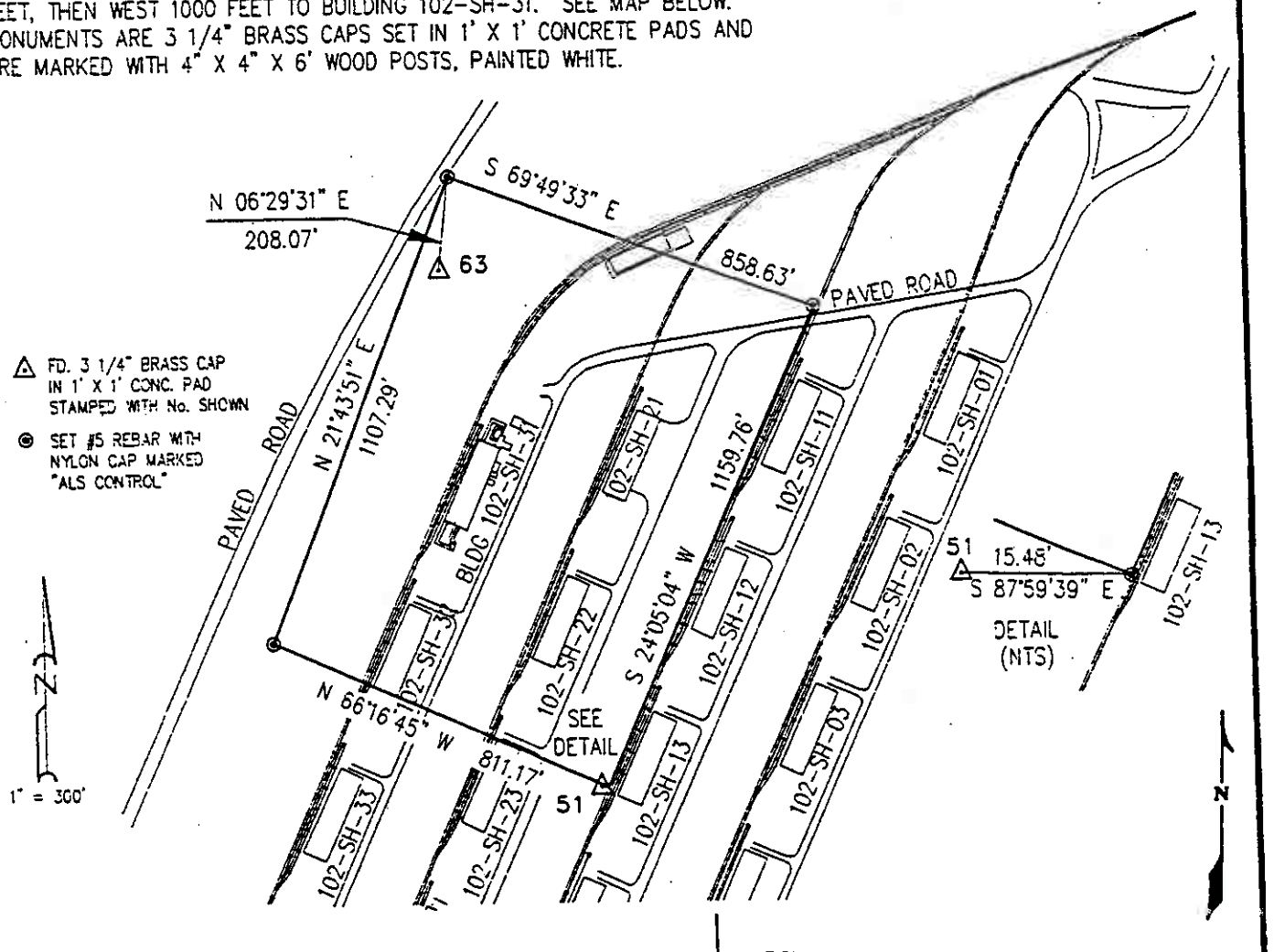
COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	51	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
HAWTHORNE NEV.	51 C-1A 1B	COE HWAAP	4152.13
LATITUDE	LONGITUDE	DATUM	DATUM
38°34'00.79994" N	118°36'30.16849" W	NAD '27	NGVD '29
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
1389476.05	492838.87	NEVADA SP WEST	A.G.S.
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE 1997 ORDER 2ND

TO OBTAIN GRID AZIMUTH, ADD ° TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

MONUMENTS 51 AND 63 – SWMU C-1A/1B
FROM HIGHWAY 95 TAKE THORNE ROAD NORTHEAST 3 MILES TO 3RD AVENUE NORTH, THEN GO NORTHEAST ON 3RD 1/2 MILE, THEN SOUTHWEST 800 FEET, THEN WEST 1000 FEET TO BUILDING 102-SH-31. SEE MAP BELOW.
MONUMENTS ARE 3 1/4" BRASS CAPS SET IN 1' X 1' CONCRETE PADS AND ARE MARKED WITH 4" X 4" X 6' WOOD POSTS, PAINTED WHITE.



SKETCH

DA FORM 1 OCT 84 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is TRADOC.

NOTES ON COMPLETION OF FORM

1. GENERAL: This form may be used in the field or, as an office form to record and publish positions, descriptions, and related data.

2. FIELD USE OF FORM: The information required should be obtained and recorded *AT THE STATION SITE*. The field engineer should fill in only the information available and applicable to field use. In general, the geographic and grid positions, azimuths, distances, and elevations should not be filled in at field level except when the information is required for an immediate specific purpose.

a. ORIGINAL DESCRIPTION OF NEW STATION: The type of mark used for the station, reference marks, and azimuth marks, and a description of each must be given in the text of the description. If a disk is used, the identity of the agency whose name is cast in the disk and all of the letters and numbers stamped on the mark which identify the organization establishing or setting the mark should be given. In many areas the use of disks is not desirable because of their loss, due to vandalism or superstition. Less conspicuous marks should be used under these conditions. This requires exact statements of the character of the marks. Information for all marks as to the elevation above or below ground and approximate elevation above or below nearby prominent features is important. At least three measurements within .01 foot should be made from the station to any permanent marks, features, or structures that would permit relocating the spot where an instrument was centered. Good judgment should be exercised as to how far these measurements should be made. It is recommended that they be made to items which are not in the immediate vicinity of the station. Angles should also be turned to these items, particularly where no azimuth mark or marks have been established.

b. VIEW: Provide information on height of tower or stand used in occupying or establishing the station and information on view from a normal tripod, i.e., a 50-foot tower was used at the station; view from a tripod height is clear to the south and east but is obstructed by rise in ground *(by 50 foot trees)* to the north and west.

c. PHOTOGRAPHIC IDENTIFICATION: Provide when possible, two measurements from the station to natural or cultural features which might be visible on aerial photography and a description of the terrain. If photographs are available identify the station thereon and note estimated accuracy of the identification.

d. NOTES ON RECOVERED STATIONS: A diligent search should be made for *ALL* previously established stations in the vicinity and no station should be reported as destroyed unless conclusive evidence of destruction is present. A statement of the diligence of the search and reason for the non-recovery of a previously established mark is required. If the spot where a station mark was located can be reproduced by measurement given in the description, the station is not destroyed. The reproduced spot should be tied in by azimuth and distance and the estimated accuracy of the reproduced location given. If a new mark is set in the exact location of a previously established but destroyed mark, the designation of the station should be identical with the original with only a new date added to its designation. If a new disk is set in the approximate location of the old station, the name should be preserved but the number "2" and a new date should be added.

(DESCRIBED) (RECOVERED) BY	
PROJECT	
DATE	FIELD BOOK

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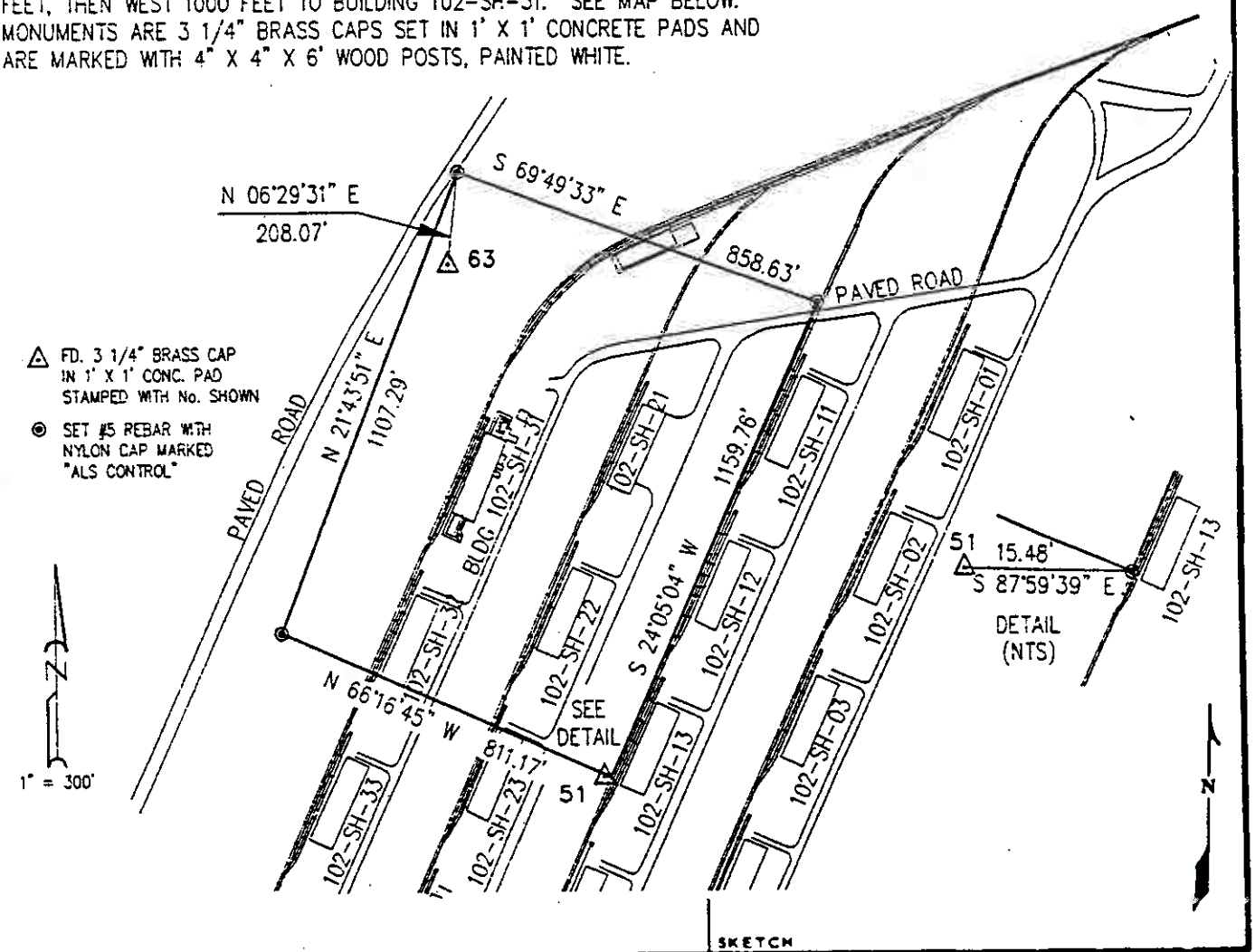
COUNTRY	TYPE OF MARK	STATION	
USA	BRASS CAP	63	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
HAWTHORNE NEV.	63 C-1A 1B	COE HWAAP	4144.20
LATITUDE	LONGITUDE	DATUM	DATUM
38°34'12.14463" N	118°36'34.46275" W	NAD '27	NGVD '29
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
1390623.70	492498.15	NEVADA SP WEST	A.L.S.
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 1997 ORDER: 2ND

TO OBTAIN GRID AZIMUTH, ADD ° TO THE GEODETIC AZIMUTH

TO OBTAIN GRID AZ. (ADD)(SUB.) ° TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOC. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

MONUMENTS 51 AND 63 – SWMU C-1A/1B
FROM HIGHWAY 95 TAKE THORNE ROAD NORTHEAST 3 MILES TO 3RD AVENUE NORTH, THEN GO NORTHEAST ON 3RD 1/2 MILE, THEN SOUTHWEST 800 FEET, THEN WEST 1000 FEET TO BUILDING 102-SH-31. SEE MAP BELOW.
MONUMENTS ARE 3 1/4" BRASS CAPS SET IN 1' X 1' CONCRETE PADS AND ARE MARKED WITH 4" X 4" X 6' WOOD POSTS, PAINTED WHITE.



SKETCH

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a. ORIGINAL DESCRIPTION OF NEW STATION: The type of mark used for the station, reference marks, and azimuth marks, and a description of each must be given in the text of the description. If a disk is used, the identity of the agency whose name is cast in the disk and all of the letters and numbers stamped on the mark which identify the organization establishing or setting the mark should be given. In many areas the use of disks is not desirable because of their loss, due to vandalism or superstition. Less conspicuous marks should be used under these conditions. This requires exact statements of the character of the marks. Information for all marks as to the elevation above or below ground and approximate elevation above or below nearby prominent features is important. At least three measurements within .01 foot should be made from the station to any permanent marks, features, or structures that would permit relocating the spot where an instrument was centered. Good judgment should be exercised as to how far these measurements should be made. It is recommended that they be made to items which are not in the immediate vicinity of the station. Angles should also be turned to these items, particularly where no azimuth mark or marks have been established.

b. VIEW: Provide information on height of tower or stand used in occupying or establishing the station and information on view from a normal tripod, i.e., a 50-foot tower was used at the station; view from a tripod height is clear to the south and east but is obstructed by rise in ground *(by 50 foot trees)* to the north and west.

c. PHOTOGRAPHIC IDENTIFICATION: Provide when possible, two measurements from the station to natural or cultural features which might be visible on aerial photography and a description of the terrain. If photographs are available identify the station thereon and note estimated accuracy of the identification.

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APPENDIX C

ANALYTICAL DATA FROM INVESTIGATION

Table 1
Summary of Lead Treatment Results
SMWU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Location ID (Grid number)	Sample Date	Depth	Lead, TCLP
				ug/l
C01a/01b-081400-SSL-A01A	A01	8/14/2000	1	74.6
C01a/01b-081400-SSL-A02A	A02	8/14/2000	1	14.9
C01a/01b-081400-SSL-A03A	A03	8/14/2000	1	88.2
C01a/01b-081400-SSL-A04A	A04	8/14/2000	1	70.5
C01a/01b-081400-SSL-A05A	A05	8/14/2000	1	13.8
C01a/01b-081300-SSL-B06B	B06	8/13/2000	1	17.9
C01a/01b-081300-SSL-B07B	B07	8/13/2000	1	83.2
C01a/01b-081300-SSL-B10B	B10	8/13/2000	1	210
C01a/01b-081300-SSL-B20B	B20	8/13/2000	1	292
C01a/01b-081300-SSL-B30B	B30	8/13/2000	1	108
C01a/01b-081300-SSL-B40B	B40	8/13/2000	1	234
C01a/01b-081300-SSL-B50B	B50	8/13/2000	1	170
C01a/01b-081300-SSL-B60B	B60	8/13/2000	1	24.7
C01a/01b-081300-SSL-B70B	B70	8/13/2000	1	9.3
C01a/01b-081400-SSL-C07A	C07	8/14/2000	1	411
C01a/01b-081400-SSL-D20A	D20	8/14/2000	1	251
C01a/01b-081400-SSL-D30A	D30	8/14/2000	1	446
C01a/01b-081400-SSL-D40A	D40	8/14/2000	1	170
C01a/01b-081400-SSL-D50A	D50	8/14/2000	1	75.2
C01a/01b-081400-SSL-D60A	D60	8/14/2000	1	14.3
C01a/01b-081400-SSL-D70A	D70	8/14/2000	1	309
C01a/01b-081400-SSL-D80A	D80	8/14/2000	1	643
C01a/01b-081400-SSL-D90A	D90	8/14/2000	1	187
C01a/01b-081400-SSL-E07A	E07	8/14/2000	1	239
C01a/01b-081400-SSL-E08A	E08	8/14/2000	1	68.3
C01a/01b-081400-SSL-F20A	F20	8/14/2000	1	21.4
C01a/01b-081400-SSL-F30A	F30	8/14/2000	1	719
C01a/01b-081400-SSL-F80A	F80	8/14/2000	1	108
C01a/01b-081300-SSL-G07B	G07	8/13/2000	1	71.2
C01a/01b-081300-SSL-G08B	G08	8/13/2000	1	32
C01a/01b-081400-SSL-G30A	G30	8/14/2000	1	586
C01a/01b-081400-SSL-G40A	G40	8/14/2000	1	3000
C01a/01b-081400-SSL-G50A	G50	8/14/2000	1	45.9
C01a/01b-081400-SSL-G60A	G60	8/14/2000	1	180
C01a/01b-081400-SSL-G70A	G70	8/14/2000	1	49.6
C01a/01b-081400-SSL-G80A	G80	8/14/2000	1	290
C01a/01b-081300-SSL-H02B	H02	8/13/2000	1	241
C01a/01b-081300-SSL-H03B	H03	8/13/2000	1	33.2
C01a/01b-081300-SSL-H04B	H04	8/13/2000	1	42.5
C01a/01b-081300-SSL-H05B	H05	8/13/2000	1	38.4
C01a/01b-081300-SSL-H06B	H06	8/13/2000	1	8.6
C01a/01b-081200-SSL-J02B	J02	8/12/2000	1	14.2
C01a/01b-081200-SSL-J03B	J03	8/12/2000	1	42.3
C01a/01b-081200-SSL-J04B	J04	8/12/2000	1	34.9
C01a/01b-081200-SSL-J05B	J05	8/12/2000	1	65.5
C01a/01b-081200-SSL-J06B	J06	8/12/2000	1	22.6
C01a/01b-081200-SSL-J07B	J07	8/12/2000	1	16.5
C01a/01b-081200-SSL-J08B	J08	8/12/2000	1	4.5
C01a/01b-081100-SSL-K02B	K02	8/11/2000	1	18.9

Table 1
Summary of Lead Treatment Results
SMWU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Location ID (Grid number)	Sample Date	Depth	Lead, TCLP
				ug/l
C01a/01b-081100-SSL-K03B	K03	8/11/2000	1	112
C01a/01b-081100-SSL-K04B	K04	8/11/2000	1	7.7
C01a/01b-081100-SSL-K05B	K05	8/11/2000	1	19.5
C01a/01b-081100-SSL-K06B	K06	8/11/2000	1	17.8
C01a/01b-081100-SSL-K07B	K07	8/11/2000	1	24.2
C01a/01b-081100-SSL-K08B	K08	8/11/2000	1	11

Analyses	55
Detections	55
Minimum Concentration	4.5
Maximum Concentration	3000
HWAD LTG - TCLP	5000
HWAD LTG - TCLP Hits	0

Table 2
Summary of Excavation Results
SWMU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Location ID (Grid number)	Sample Date	Depth	Lead, Total	Excavation Status
				mg/kg	
C01a/01b-082700-SST-A01A	A01	8/27/2000	1	422	Pass
C01a/01b-082700-SST-A02A	A02	8/27/2000	1	20.5	Pass
C01a/01b-082700-SST-A03A	A03	8/27/2000	1	218	Pass
C01a/01b-082700-SST-A04A	A04	8/27/2000	1	230	Pass
C01a/01b-082700-SST-A05A	A05	8/27/2000	1	4.8	Pass
C01a/01b-082400-SST-B06A	B06	8/24/2000	1	10.2	Pass
C01a/01b-082400-SST-B07A	B07	8/24/2000	1	252	Pass
C01a/01b-082700-SST-B10A	B10	8/27/2000	1	22.9	Pass
C01a/01b-082700-SST-B20A	B20	8/27/2000	1	313	Pass
C01a/01b-082700-SST-B30A	B30	8/27/2000	1	21.9	Pass
C01a/01b-082700-SST-B40A	B40	8/27/2000	1	480	Pass
C01a/01b-082700-SST-B50A	B50	8/27/2000	1	20.4	Pass
C01a/01b-082700-SST-B60A	B60	8/27/2000	1	378	Pass
C01a/01b-082700-SST-B70A	B70	8/27/2000	1	309	Pass
C01a/01b-082400-SST-C07A	C07	8/24/2000	1	1180	Pass
C01a/01b-082800-SST-D20A	D20	8/28/2000	1	126	Pass
C01a/01b-082800-SST-D30A	D30	8/28/2000	1	**5110**	Fail
C01a/01b-090500-SST-D30A	D30	9/4/2000	1.5	**32800**	Fail
C01a/01b-090900-SST-D30A	D30	9/9/2000	2	1200	Pass
C01a/01b-082800-SST-D40A	D40	8/28/2000	1	17.2	Pass
C01a/01b-082800-SST-D50A	D50	8/28/2000	1	11.4	Pass
C01a/01b-082800-SST-D60A	D60	8/28/2000	1	14	Pass
C01a/01b-082800-SST-D70A	D70	8/28/2000	1	**9160**	Fail
C01a/01b-090500-SST-D70A	D70	9/4/2000	1.5	2.6	Pass
C01a/01b-082400-SST-D80A	D80	8/24/2000	1	71.2	Pass
C01a/01b-082400-SST-D90A	D90	8/24/2000	1	96.4	Pass
C01a/01b-082400-SST-E07A	E07	8/24/2000	1	**2630**	Fail
C01a/01b-082900-SST-E07A	E07	8/29/2000	1.5	18.7	Pass
C01a/01b-082400-SST-E08A	E08	8/24/2000	1	256	Pass
C01a/01b-082800-SST-F20A	F20	8/28/2000	1	6.3	Pass
C01a/01b-082800-SST-F30A	F30	8/28/2000	1	**2550**	Fail
C01a/01b-090500-SST-F30A	F30	9/4/2000	1.5	**50900**	Fail
C01a/01b-090900-SST-F30A	F30	9/9/2000	2	**16100**	Fail
C01a/01b-091200-SST-F30A	F30	9/12/2000	2.5	**2100**	Fail
C01a/01b-091300-SST-F30A	F30	9/13/2000	3	4.3	Pass
C01a/01b-082400-SST-F80A	F80	8/24/2000	1	915	Pass
C01a/01b-082900-SST-G07A	G07	8/29/2000	1	5	Pass
C01a/01b-082900-SST-G08A	G08	8/29/2000	1	2.8	Pass
C01a/01b-083000-SST-G30A	G30	8/30/2000	1	8.5	Pass
C01a/01b-083000-SST-G40A	G40	8/30/2000	1	3.4	Pass
C01a/01b-083000-SST-G50A	G50	8/30/2000	1	3	Pass
C01a/01b-083000-SST-G60A	G60	8/30/2000	1	2.7	Pass
C01a/01b-083000-SST-G70A	G70	8/30/2000	1	1280	Pass
C01a/01b-083000-SST-G80A	G80	8/30/2000	1	5.4	Pass
C01a/01b-082900-SST-H02A	H02	8/29/2000	1	2	Pass
C01a/01b-082900-SST-H03A	H03	8/29/2000	1	2.1	Pass
C01a/01b-082900-SST-H04A	H04	8/29/2000	1	6.9	Pass
C01a/01b-082900-SST-H05A	H05	8/29/2000	1	7.4	Pass
C01a/01b-082900-SST-H06A	H06	8/29/2000	1	2.3	Pass

Table 2
Summary of Excavation Results
SWMU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Location ID (Grid number)	Sample Date	Depth	Lead, Total	Excavation Status
				mg/kg	
C01a/01b-082900-SST-J02A	J02	8/29/2000	1	203	Pass
C01a/01b-082900-SST-J03A	J03	8/29/2000	1	2	Pass
C01a/01b-082900-SST-J04A	J04	8/29/2000	1	5.3	Pass
C01a/01b-082900-SST-J05A	J05	8/29/2000	1	3.9	Pass
C01a/01b-082900-SST-J06A	J06	8/29/2000	1	3.9	Pass
C01a/01b-082900-SST-J07A	J07	8/29/2000	1	4.1	Pass
C01a/01b-082900-SST-J08A	J08	8/29/2000	1	3.5	Pass
C01a/01b-082900-SST-K02A	K02	8/29/2000	1	1.9	Pass
C01a/01b-082900-SST-K03A	K03	8/29/2000	1	1.7	Pass
C01a/01b-082900-SST-K04A	K04	8/29/2000	1	4.6	Pass
C01a/01b-082900-SST-K05A	K05	8/29/2000	1	3.3	Pass
C01a/01b-082900-SST-K06A	K06	8/29/2000	1	4	Pass
C01a/01b-082900-SST-K07A	K07	8/29/2000	1	5.4	Pass
C01a/01b-082900-SST-K08A	K08	8/29/2000	1	6.5	Pass

Analyses	63
Detections	63
Minimum Concentration	1.7
Maximum Concentration	50900
Background Concentration	16.7
Background Hits	31
HWAD - PCG	100
HWAD - PCG Hits	23
HWAD - LEG	2000
HWAD - LEG Hits	8

Table 3
Summary of Soil Boring Results
SWMU C01a/01b - Building 103-21 Rotary Deactivation Furnaces

Sample ID	Location ID	Sample Date	Depth	Lead, Total
				mg/kg
C01a/01b-SB01A-01	SB01	10/3/2000	2	11.2
C01a/01b-SB01A-02	SB01	10/3/2000	3	59.8
C01a/01b-SB01A-03	SB01	10/3/2000	5	3.4
C01a/01b-SB02A-01	SB02	10/3/2000	2	7.1
C01a/01b-SB02A-02	SB02	10/3/2000	3	4.7
C01a/01b-SB02A-03	SB02	10/3/2000	5	2.5
C01a/01b-SB03A-01	SB03	10/3/2000	2	16.4
C01a/01b-SB03A-02	SB03	10/3/2000	3	3.6
C01a/01b-SB03A-03	SB03	10/3/2000	5	2.6
C01a/01b-SB04A-01	SB04	10/3/2000	2	10.2
C01a/01b-SB04A-02	SB04	10/3/2000	3	4.3
C01a/01b-SB04A-03	SB04	10/3/2000	5	4.1
C01a/01b-SB05A-01	SB05	10/3/2000	2	28.9
C01a/01b-SB05A-02	SB05	10/3/2000	3	7.1
C01a/01b-SB05A-03	SB05	10/3/2000	5	1.8
C01a/01b-SB06A-01	SB06	10/3/2000	2	29.1
C01a/01b-SB06A-02	SB06	10/3/2000	3	**109**
C01a/01b-SB06A-03	SB06	10/3/2000	5	2.8
C01a/01b-SB07A-01	SB07	10/3/2000	2	40.8
C01a/01b-SB07A-02	SB07	10/3/2000	3	7.2
C01a/01b-SB07A-03	SB07	10/3/2000	5	2
C01a/01b-SB08A-01	SB08	10/3/2000	2	5
C01a/01b-SB08A-02	SB08	10/3/2000	3	2.6
C01a/01b-SB08A-03	SB08	10/3/2000	5	1.8
C01a/01b-SB09A-01	SB09	10/4/2000	2	11.3
C01a/01b-SB09A-02	SB09	10/4/2000	3	3.3
C01a/01b-SB09A-03	SB09	10/4/2000	5	1.6
C01a/01b-SB10A-01	SB10	10/4/2000	2	37.4
C01a/01b-SB10A-02	SB10	10/4/2000	3	**113**
C01a/01b-SB10A-03	SB10	10/4/2000	5	2.2
C01a/01b-SB11A-01	SB11	10/4/2000	2	**102**
C01a/01b-SB11A-02	SB11	10/4/2000	3	4.3
C01a/01b-SB11A-03	SB11	10/4/2000	5	1.6
C01a/01b-SB12A-01	SB12	10/4/2000	2	37.7
C01a/01b-SB12A-02	SB12	10/4/2000	3	3.6
C01a/01b-SB12A-03	SB12	10/4/2000	5	1.5

Analyses	36
Detections	36
Minimum Concentration	1.5
Maximum Concentration	113
HWAD - PCG	100
HWAD - PCG Hits	3
HWAD - LEG	2000
HWAD - LEG Hits	0
Background Concentration	16.7
Background Hits	9

Table 4
Summary of Backfilling Results
SWMU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Location ID	Sample Date	Depth	Lead, Total
				mg/kg
C01a/01b-090100-CS-01	CS01	9/1/2000	0	2.4
C01a/01b-090200-CS-02	CS02	9/2/2000	0	3.8
C01a/01b-090200-CS-03	CS03	9/2/2000	0	4.6
C01a/01b-090300-CS-04	CS04	9/3/2000	0	6
C01a/01b-090300-CS-05	CS05	9/3/2000	0	5.2
C01a/01b-090400-CS-06	CS06	9/4/2000	0	7.2
C01a/01b-090400-CS-07	CS07	9/4/2000	0	9
C01a/01b-090400-CS-08	CS08	9/4/2000	0	6.7
C01a/01b-090500-CS-09	CS09	9/5/2000	0	5.8
C01a/01b-090500-CS-10	CS10	9/5/2000	0	6.1
C01a/01b-090500-CS-11	CS11	9/5/2000	0	7
C01a/01b-090500-CS-12	CS12	9/5/2000	0	5.9
C01a/01b-090600-CS-13	CS13	9/6/2000	0	3.7
C01a/01b-090600-CS-14	CS14	9/6/2000	0	3.8
C01a/01b-090600-CS-15	CS15	9/6/2000	0	3.8

Analyses	15
Detections	15
Minimum Concentration	2.4
Maximum Concentration	9
Background Concentration	16.7
Background Hits	0
HWAD - PCG	100
HWAD - PCG Hits	0
Backfill Goal of 1/4 LEG	500
Backfill Goal Hits	0

Table 5
Summary of Groundwater Results
SWMU C01a/01b - Building 102-31 Rotary Deactivation Furnaces

Sample ID	Sample Date	Lead, Total ug/l
IRPMW28-012997-W	1/29/97	<0.6
IRPMW28A-042897-W	4/28/97	4.4 J
IRPMW28B-042897-W	4/28/97	1.4 J
IRPMW28-030898-W	3/8/98	2.2
IRPMW29C-013097-W	1/30/97	1.1 J
IRPMW29-042897-W	4/28/97	1.8 J
IRPMW29-030698-W	3/6/98	<0.9
IRPMW30-013097-W	1/30/97	<5
IRPMW30A-042297-W	4/22/97	<0.6
IRPMW30B-042297-W	4/22/97	1.6 B
IRPMW30-030698-W	3/6/98	<0.9
IRPMW30A-021799-W	2/17/99	<1.1 UJ
IRPMW30B-021799-W	2/17/99	<1.1 UJ
IRPMW31-013097-W	1/30/97	<5
IRPMW31-042297-W	4/22/97	<0.6
IRPMW31-030698-W	3/6/98	<0.9
IRPMW31-021799-W	2/17/99	<1.1 UJ

Analyses	17
Detections	6
Minimum Concentration	1.1
Maximum Concentration	4.4
HWAD_-_GW_Action_Level	15
HWAD_-_GW_Action_Level Hits	0